IN THE CLAIMS

Please amend the claims as follows. This claim set is to replace all prior versions.

1-20. (Cancelled)

21. (Previously Presented) A method, comprising:

providing a disk drive having a disk and a head for writing data to reading data from the disk;

sensing a temperature of the disk drive;

determining a maximum write current which satisfies a predetermined bit error rate associated with writing data to the disk using the head; then

determining whether the maximum write current satisfies a write induced instability test associated with reading data from the disk using the head; and

if the maximum write current does not satisfy the write induced instability test, then reducing the maximum write current until the write induced instability test is satisfied.

22. (Previously Presented) The method of claim 21, wherein the write induced instability test includes:

writing a test sequence to multiple data sectors on the disk using the maximum write current and the head; and

reading servo sector position data from the disk using the head immediately after writing the test sequence.

23. (Previously Presented) The method of claim 22, wherein the write induced instability test is not satisfied if an error exists in reading the servo sector position data.

24. (Previously Presented) The method of claim 21, wherein if the maximum write current satisfies the write induced instability test, then

determining whether the maximum write current satisfies a pole tip protrusion test associated with the head; and

if the maximum write current does not satisfy the pole tip protrusion test, then reducing the maximum write current until the pole tip protrusion test is satisfied.

25.   (Previously Presented) A method for providing temperature compensated write current in a disk drive, comprising:

measuring a temperature of the disk drive;

writing data to a first track of a disk using a head as a write current is supplied to the head;

writing data to second and third tracks adjacent to the first track as the write current is supplied to the head;

reading the data from the first track using the head;

determining a bit error rate for the data read from the first track using the head; \

in response to the bit error rate within a predetermined bit error rate, increasing the write current and repeating the steps of writing data to the first, second and third tracks as the increased write current is supplied to the head;

in response to the bit error rate exceeding the predetermined bit error rate, decreasing the write current;

setting a nominal write current that does not result in the bit error rate exceeding the predetermined bit error rate; then

writing data to track of the disk as the nominal write current is supplied to the head and;

in response to detecting at leas tone of an error reading servo sector position information from the track using the head and a position error signal indicating a change in position of the head relative to the track, decreasing the nominal write current.

26.   (Previously Presented) The method of claim 25, further comprising decreasing the nominal write current in response to detecting the error.

27.   (Previously Presented) The method of claim 26, wherein the error is due to write induced instability of the head

28.   (Previously Presented) The method of claim 25, further comprising decreasing the nominal write current in response to the position error signal indicating the change in position of the head.

29.   (Previously Presented) The method of claim 25, wherein the change in position or the head is due to pole tip protrusion of the head.

30.   (Previously Presented) The method of claim 25, further comprising:

detecting the nominal write current in response to detecting the error due to write induced instability of the head; and

decreasing the nominal write current in response to the position error signal indicating the change in position of the head due to pole tip protrusion of the head.

31-45. Canceled

46.   (Currently Amended) ~~The method of claim 31, including~~ In a disk drive that includes a disk and a head that reads from and writes to the disk, wherein the head writes to the disk in response to a write current, a method of compensating the write current for a temperature of the disk drive, the method of comprising:

measuring an ambient temperature of the disk drive;

providing a first write current with acceptable bit error rate at the ambient temperature by adjusting an initial write current; and then

providing a second write current with acceptable stability of the head at the ambient temperature by adjusting the first write current; and

providing a third write current with acceptable pole tip protrusion of the head at the ambient temperature by adjusting the second write current.

47.   (Previously Presented) The method of claim 46, including:

reading servo information from the disk using the head;

generating a position error signal in response to the read servo information;

comparing the position error signal to a threshold; and

changing the write current in response to the comparison.

48.   (Previously Presented) The method of claim 47, including changing the write current in response to an abrupt change in the position error signal.

49.   (Previously Presented) The method of claim 47, including decreasing the write current if the position error signal is greater than the threshold.

50.   (Previously Presented) The method of claim 47, including decreasing the write current if the position error signal is greater than the threshold and then repeating the reading, the generating, the comparing and the changing for the decreased write current.

51.   (Previously Presented) In a disk drive that includes a disk and a head that reads from and writes to the disk, wherein the head writes to the disk in response to a write current, a method of compensating the write current for a temperature of the disk drive, the method of comprising:

measuring an ambient temperature of the disk drive using a temperature sensor in the disk drive;

providing a first write current with acceptable bit error rate at the ambient temperature, starting with an initial write current, by:

(i) writing a first test sequence to the disk using the head;

(ii) reading the first test sequence from the disk using the head;

(iii) measuring a bit error rate of the read first test sequence;

(iv) comparing the measured bit error rate to a threshold; and

(v) changing the write current in response to the comparison; and then

providing a second write current with acceptable stability of the head at the ambient temperature, starting with the first write current, by:

(vi) writing a second test sequence to the disk using the head;

(vii) reading servo information from the disk using the head immediately following writing the second test sequence; and

(viii) decreasing the write current in response to an error in the read servo information.

52.   (Previously Presented) The method of claim 51, including increasing the write current in step (v) if the measured bit error rate is less than the threshold.

53.   (Previously Presented) The method of claim 51, including decreasing the write current in step (v) if the measured bit error rate is greater than the threshold.

54.   (Previously Presented) The method of claim 51, including generating the error in step (viii) in response to failing to recover gray code in the servo information.

55.   (Previously Presented) The method of claim 51, including providing a third write current with acceptable pole tip protrusion of the head at the ambient temperature, starting with the second write current, by:
        (ix) writing a third test sequence to the disk using the head;
        (x) reading servo information from the disk using the head immediately following writing the third test sequence;
        (xi) generating a position error signal in response to the read servo information; and
        (xii) decreasing the write current in response to an abrupt change in the position error signal.

56.   (Previously Presented) The method of claim 55, including writing the second and third test sequences in steps (vi) and (ix) as the same test sequence on a track on the disk, and reading the servo information in steps (vii) and (x) from the track.

57.   (Previously Presented) The method of claim 51, including providing the first write current as a maximum write current with acceptable bit error rate, and providing the second write current as a maximum write current with acceptable stability of the head.

58.   (Previously Presented) The method of claim 51, including performing the method on a zone-by-zone basis for each zone on the disk.

59.   (Previously Presented) The method of claim 51, including performing the method on a head-by-head basis for each head in the disk drive.

60.   (Previously Presented) The method of claim 51, including performing the method on an ambient temperature by ambient temperature basis for multiple ambient temperatures of the disk drive above and below an ambient temperature range.

61.   (Previously Presented) In a disk drive that includes a disk and a head that reads from and writes to the disk in response to a write current, a method of compensating the write current for a temperature of the disk drive, the method of comprising:

measuring an ambient temperature of the disk drive using a temperature sensor in the disk drive;

providing a first write current with acceptable bit error rate at the ambient temperature, starting with an initial write current, by:

(i) writing a first test sequence to the disk using the head;

(ii) reading the first test sequence from the disk using the head;

(iii) measuring a bit error rate of the read first test sequence;

(iv) comparing the measured bit error rate to a threshold; and

(v) increasing the write current and repeating steps (i) through (v) if the measured bit error rate is less than the threshold, otherwise setting the first write current to the write current in step (i); and then

providing a second write current with acceptable stability of the head at the ambient temperature starting with the first write current, by:

(vi) writing a second test sequence to the disk using the head;

(vii) reading servo information from the disk using the head immediately following writing the second test sequence; and

(viii) decreasing the write current and repeating steps (vi) through (viii) in response to an error in the read servo information, otherwise setting the second write current to the write current in step (vi).

62.   (Previously Presented) The method of claim 61, wherein increasing the write current in step (v) enables the head to sufficiently magnetize the disk during write operations.

63.   (Previously Presented) The method of claim 61, wherein increasing the write current in step (v) enables the head to reliably encode data on the disk during write operations.

64.   (Previously Presented) The method of claim 61, including generating the error in step (viii) in response to failing to recover gray code in the servo information.

65.   (Previously Presented) The method of claim 61, including providing a third write current with acceptable pole tip protrusion of the head at the ambient temperature, starting with the second write current, by:

        (ix) writing a third test sequence to the disk using the head;

        (x) reading servo information from the disk using the head immediately following writing the third test sequence;

        (xi) generating a position error signal in response to the read servo information; and

        (xii) decreasing the write current and repeating steps (ix) through (xii) in response to an abrupt change in the position error signal error, otherwise setting the theird write current to the write current in step (ix).

66.   (Previously Presented) The method of claim 65, including writing the second and third test sequences in steps (vi) and (ix) as the same test sequence on a track on the disk, and reading the servo information in steps (vii) and (x) from the track.

67.   (Previously Presented) The method of claim 61, including providing the first write current as a maximum write current with acceptable bit error rate, and providing the second write current as a maximum write current with acceptable stability of the head.

68.   (Previously Presented) The method of claim 61, including performing the method on a zone-by-zone basis for each zone on the disk.

69.   (Previously Presented) The method of claim 61, including performing the method on a head-by-head basis for each head in the disk drive.

70.   (Previously Presented) The method of claim 61, including performing the method on an ambient temperature by ambient temperature basis for multiple ambient temperatures of the disk drive above and below an ambient temperature range.